Exhibit 1: Potential Sources of DNA Reference Samples

Source	Description	Comments
Personal items (also known as direct references)	Biological samples include blood stain cards, blood stored for elective surgery, pathology samples, semen samples, and extracted or "lost" (adult or baby) teeth. Personal use items include hairbrushes, toothbrushes, razors, unwashed undergarments, and used personal hygiene items (e.g., sanitary napkins).	Personal items are the most precious of all samples (including human remains) because they are so scarce. Personal items allow for the simplest type of DNA matching: direct comparison. However, sole use by only the victim can be difficult to ensure. Before reporting an identification, the lab must verify that the DNA from the personal item belongs to the victim. This is done either administratively or through DNA interpretation. Personal items require forensic analysis conditions (extraction, quantitation, etc.).
Biological relatives (kin)	Samples are collected from biological relatives. Kinship samples are typically collected using buccal swabs.	The relatives' biological relationship to the victim largely determines the utility of the sample (e.g., parents provide better reference samples than cousins). Distant relatives can be useful if there are many of these types of relatives in kinship analysis, but the analysis of the pedigree can become very difficult. Although biologically unrelated to the victim, the surviving parent of a missing person's biological child can assist in determining an identification. Sometimes the relative does not know his or her true relationship (if any) to the victim. The lab must verify (administratively or through DNA interpretation) the relationship before reporting an identification. If collected properly, kinship samples provide an abundant quantity of DNA.
Previously identified human remains	Human remains identified using other modalities. For example, DNA from a torso identified through a medical examination or a unique tattoo may be used as a reference sample to identify other remains fragments; or well-characterized DNA profiles from other fragments may be useful to associate samples.	Like personal items, previously identified remains can be directly matched to unknown samples. Single teeth have proven to be unreliable reference samples because they are easily misidentified through non-DNA modalities.